

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of: Eric JACQUINOT et al

Application No.: 09/427,675

Filed: October 27, 1999

For: NEW ABRASIVE COMPOSITION FOR THE INTEGRATED CIRCUITS ELECTRONICS...

Art Unit: 1765

Examiner: D. Deo

Washington, D.C.

Atty.'s Docket: JACQUINOT=7

Date: December 14, 2001

THE COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

Sir:

Transmitted herewith is a [X] BRIEF ON BEHALF OF APPELLANT in the above-identified application.

[ ] Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.

[ ] A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.

[XX] Fee for Filing a Brief in Support of an Appeal, \$320.00.

The fee has been calculated as shown below:

	(Col. 1)		(Col. 2)	(Col. 3)
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA EQUALS
TOTAL	*	MINUS	** 20	0
INDEP.	*	MINUS	*** 3	0
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				

ADDITIONAL FEE TOTAL

SMALL ENTITY	
RATE	ADDITIONAL FEE
x 9	\$
x 42	\$
+ 135	\$
ADDITIONAL FEE TOTAL	
	\$

OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE
x 18	\$
x 84	\$
+ 270	\$
TOTAL	
	\$

OR

OR

\* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.

\*\* If the "Highest Number Previously Paid for" IN THIS SPACE is less than 20, write "20" in this space.

\*\*\* If the "Highest Number Previously Paid for" IN THIS SPACE is less than 3, write "3" in this space.

The "Highest Number Previously Paid For" (total or independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment of the number of claims originally filed.

[XX] Conditional Petition for Extension of Time

If any extension of time for a response is required, applicant requests that this be considered a petition therefor.

[ ] It is hereby petitioned for an extension of time in accordance with 37 CFR 1.136(a). The appropriate fee required by 37 CFR 1.17 is calculated as shown below:

Small Entity

Response Filed Within

[ ] First - \$ 55.00  
[ ] Second - \$ 200.00  
[ ] Third - \$ 460.00  
[ ] Fourth - \$ 720.00

Month After Time Period Set

Other Than Small Entity

Response Filed Within

[ ] First - \$ 110.00  
[ ] Second - \$ 400.00  
[ ] Third - \$ 920.00  
[ ] Fourth - \$ 1440.00

Month After Time Period Set

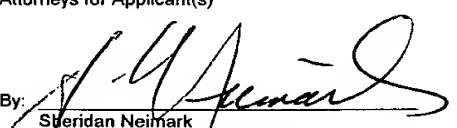
[ ] Less fees (\$ ) already paid for month(s) extension of time on .

[XX] Credit Card Payment Form, PTO-2038, is attached, authorizing payment in the amount of \$320.00.

[XX] The Commissioner is hereby authorized and requested to charge any additional fees which may be required in connection with this application or credit any overpayment to Deposit Account No. 02-4035. This authorization and request is not limited to payment of all fees associated with this communication, including any Extension of Time fee, not covered by check or specific authorization, but is also intended to include all fees for the presentation of extra claims under 37 CFR §1.16 and all patent processing fees under 37 CFR §1.17 throughout the prosecution of the case. This blanket authorization does not include patent issue fees under 37 CFR §1.18.

BROWDY AND NEIMARK

Attorneys for Applicant(s)

By:   
Sheridan Neimark  
Registration No. 20,520

Facsimile: (202) 737-3528  
Telephone: (202) 628-5197

F:\r\inu\jacquinot\pto\Cvr Brief.doc

RECEIVED  
DEC 19 2001  
TC 1700



#15  
vld  
12/19/01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	)	Art Unit: 1765
Eric JACQUINOT et al	)	Examiner: D. Deo
Appln. No.: 09/427,675	)	Washington, D.C.
Date Filed: October 27, 1999	)	December 14, 2001
For: NEW ABRASIVE COMPOSITION FOR THE INTEGRATED...	)	
	)	ATTY.'S DOCKET: JACQUINOT=7

RECEIVED  
DEC 19 2001  
TC 1700

**BRIEF ON BEHALF OF APPELLANTS**

Honorable Commissioner for Patents  
Washington, D.C. 20231

Sir:

The present Appeal is taken from the Action of the Examiner in finally rejecting claims 17-36. A clean copy of these claims, double spaced, appears in the Appendix to this Brief.

**REAL PARTY IN INTEREST**

The real party in interest is Clariant (France) S.A. of Puteaux, France.

**RELATED APPEALS AND INTERFERENCES**

Undersigned is aware of no related Appeals or Interferences.

12/17/2001 EABUBAK1 00000109 09427675

01 FC:120

320.00 OP

STATUS OF THE CLAIMS

Claims 1-16 have been cancelled. Claims 17-36 stand rejected.

STATUS OF AMENDMENTS

All amendments have been entered except for the amendment after final Action of September 21, 2001, which was refused entry.

SUMMARY OF INVENTION

The present invention relates to a process for mechanical chemical polishing of silicon oxide and/or silicon nitride surfaces, or low dielectric polymer surfaces, wherein an abrasive liquid composition comprising an aqueous acid suspension of (1) individualized colloidal silica particles not linked to each other by siloxane bonds and (2) a **surfactant** is used. (Specification<sup>1</sup> page 1, numbered lines 6-10; page 6, lines 3-10; claim 17)

Under preferred conditions of implementation of the invention, the pH of the composition is between 1 and 5, preferably between 2 and 3. (Paragraph spanning pages 6 and 7; claims 20-22 and claims 23-25)

As far as the size of the particles is concerned, a preferred average diameter of the individualized abrasive

---

<sup>1</sup> Unless otherwise indicated, references hereinafter are to Appellants specification.

particles is between 12 and 100 nm, preferably 35 and 50 nm.

(page 6, lines 20-22; claims 20-22; and claims 23-25)

As cationic surfactants tend to destabilize the polishing composition, the surfactant is preferably non-ionic or anionic (see page 7, lines 20-26; claims 18 and 19), particularly the latter.

As regards the concentration of the silica particles, it is preferably between 25% and 35% (page 7, line 5; claims 28-30). The volumetric concentration of the surfactant in the aqueous suspension is between 0.001% and 5% (page 7, line 14; claims 31-33), and more preferably between 0.001% and 1% (page 7, line 15; claims 34-36).

In the present invention, the use of a surfactant in the aqueous acid suspension allows the polishing speed of the silicon nitride to be reduced very considerably while maintaining the polishing speed of the silicon oxide at a sufficient level. In this regard, Appellants' specification states as follows at page 7, lines 7-11:

The surfactant used allows the polishing speed of the silicon nitride to be reduced very considerably whilst preserving the polishing speed of the silicon oxide. A selective polishing of the silicon oxide relative to the silicon nitride is thus obtained. It also allows the polishing speed of polymers with a low dielectric constant to be increased very considerably.

A selective polishing of the silicon oxide related to the silicon nitride is thus obtained (please also see example 1, test 4; example 2, test 9; example 11, test 3; and example 13 test 4). As stated above, the use of the surfactant further allows the polishing speed of polymers with a low dielectric constant to be increased very considerably (please also note example 5 of the present specification).

In use, the slurry of the present invention, a liquid composition containing an abrasive as pointed out above, it poured on a rotating pad as noted for example on page 9, line 9, and in Example 1 which shows an abrasive flow rate of 100 cm<sup>3</sup>/min.

#### ISSUES

There is only one main issue, namely whether or not each of Appellants' claims would have been obvious in the sense of §103 from a consideration together of the three cited references, i.e. Jacquinet et al USP 6,043,159 (Jacquinet), Robinson et al USP 5,733,176 (Robinson), and Bruxvoort et al USP 5,958,794 (Bruxvoort). There are a number of sub-issues as well including, *inter alia*,

whether or not it would have been obvious to a person of ordinary skill in the art at the time the present invention was made to attempt to combine the three citations, e.g. the citations provide any motive or incentive, reason or

purpose, teaching or suggestion for their combination as proposed;

whether or not any combination of the three citations together would result in the claimed subject matter, even if it were obvious to attempt to combine them; and

whether or not Appellants' results could have been predicted or foreseen from the prior art, i.e. whether or not there would have been a reasonable expectation of obtaining Appellants' improved results from a consideration of the citations together.

Other sub-issues will become apparent from Appellants' argument section appearing below.

#### GROUPING OF CLAIMS

Appellants' claims do not all stand or fall together for the reasons pointed out in the "Argument" section below.

Claims 18 and 19 should be considered separately from claim 17.

For the purpose of confirming that Appellants' "aqueous acid suspension" corresponding to Appellants' abrasive composition" is a liquid, i.e. a slurry, claims 26-29 (which recite the concentration in the aqueous acid suspension of the silica particles) should be considered in addition to claim 17.

In addition, claims 31-36, which recite the volumetric concentration of the surfactant in the aqueous acid suspension, should also be considered separately from the other claims.

Otherwise, for purposes of this Appeal, the other claims may be considered together.

Appellants make no admissions that any of the claims are or are not patentably distinct from one another.

#### ARGUMENT

Appellants' claims stand rejected under 35 U.S.C. 103 as allegedly obvious from a consideration together of Jacquinet, Robinson and Bruxvoort. To the contrary, it is submitted that Appellants' claimed subject matter would not have been obvious to the person of ordinary skill in the art at the time the present invention was made from a consideration of the three references relied upon.

Appellants believe and respectfully submit that there is nothing in the record to support the Examiner's allegations of obviousness of combining the three citations in any way whatsoever, let alone in a way which corresponds to or would lead to Appellants' claimed subject matter. Appellants respectfully submit that the only place where the Examiner could have gotten the idea to combine the diverse citations as set forth in the rejection was from Appellants' own disclosure

which of course is not available as prior art in view of the fact that \$103 requires that the claimed invention would have been obvious to a person of ordinary skill in the art at the time the present invention was made.

Appellants' invention as claimed would not have been *prima facie* obvious to those of ordinary skill in the art because the prior art provides no motive, no incentive, no reason and no purpose to combine the prior art as proposed, and there is no other evidence of the obviousness of doing so. The Examiners have not met their burden.

#### I. The Errors in the Rejection

The rejection is erroneous because there is nothing in the prior art which would have made it obvious to add a surfactant, and particularly an anionic or non-ionic surfactant, to the abrasive slurry of Jacquinet.

The rejection is erroneous because the proposed combination makes no sense, unless one has first looked at Appellants' specification.

The rejection is erroneous because the Examiner has not pointed out (and cannot point out) what incentive or motive exists in the prior art (not in Appellants' specification) for adding a surfactant to the slurry of Jacquinet.



The rejection is erroneous because the improved results obtained by Appellants' process could not have been predicted or foreseen.

Other errors in the rejections will be apparent from the arguments appearing below.

## II. What the Prior Art Discloses

Jacquinet is a patent based on the earlier work of two of the present three Inventor-Appellants, and was granted from an application examined and issued by the present assistant examiner and primary examiner. It discloses a method of chemical mechanical polishing of electric isolation material using an acid aqueous suspension of colloidal silica containing individualized colloidal silica particles, not linked together by siloxane bonds, and water as the suspension medium. Abrasion is carried out by rubbing the layer in question using a fabric which has been impregnated with the acid aqueous suspension of colloidal silica.

Consistent with the process of the present invention, the particle size of the silica particles is between 3 and 250 nm, preferably between 3 and 150 nm, and most preferably between 10 and 50 nm.

In addition, the pH is between 1 and 6, preferably 1.5-4 and most preferably 2-3.

However, Jacquinot is directed to the chemical mechanical polishing specifically of silicon dioxide layers, and no mention is made of the polishing of silicon nitride, polymers having low dielectric constant, or materials formed of one layer of silicon oxide and another layer of silicon nitride, in which the problems exist which necessitated the present invention.

Most importantly, Jacquinot does not disclose the presence of a surfactant in the liquid abrasive composition which is impregnated into the fabric used for rubbing the surface to be polished.

Robinson is directed to a polishing pad containing voids and optional abrasive particles incorporated within the pad. Please note that the pad is a **solid** pad. Such a pad has a thickness of about ten to about a hundred mils, and is molded from composite or elastomeric substances (see the bottom of column 4). Various polishing techniques are mentioned, but there is no teaching that a liquid abrasive is equivalent to a solid abrasive (and they are not equivalent). Appellants see nothing in Robinson which even mentions the possibility of adding a surfactant to a polishing slurry, let alone that any such expedient could produce an improved result. The relevance of Robinson to the present invention is unclear to Appellants, and is believed to be tenuous at best.

Appellants believe that Robinson is irrelevant to the present invention.

Bruxvoort, like Robinson, relates to a solid abrasive, e.g. something in the nature of very fine sandpaper.

As mentioned at about the middle of column 1, a first aspect of Bruxvoort involves a method of contacting the surface of a semi-conductor wafer with a three-dimensional, textured, fixed abrasive article that includes a plurality of abrasive particles and a binder in the form of a pre-determined pattern, and moving the wafer and the fixed abrasive article relative to one another to modify the surface of the wafer. This operation may be carried out in the presence of a liquid which preferably is water at a pH of at least 5 and preferably 5-8 or 8-13. In the second, third and fourth aspects of Bruxvoort (bottom half of column 3), the same steps are carried out, with the nature of the abrasive article being somewhat different in each case.

Surfactants are mentioned in the paragraphs spanning columns 20 and 21, **but these surfactants are used in the manufacture of the pad**, i.e. in providing the abrasive coating on the pad, and have nothing to do with the liquid medium fed between the pad and the surface to be worked as shown in Fig. 3. Thus, abrasive particles may be mixed with an additive such as a surfactant for improving the dispersability of the

abrasive particles in the binder precursor and/or the binder, because of their wetting properties (e.g. column 20, lines 35 et seq). In the course of preparing the pad, the abrasive slurry is transformed into the abrasive coating adhered to the pad, and curing takes place using ultra-violet radiation to provide a solid article. The optional surfactant in this regard is only used for preparing the cured article. See for example Figs. 16 and 17 and the text at the bottom of column 2.

However, Bruxvoort does have a large basket or shotgun disclosure of possible additives including "surfactants" and "wetting agents" at col. 13, lines 14-15, but without any detail, without specifying what kinds of surfactants or wetting agents, without specifying quantities, and without giving any reasons for including three possible additives.

### III. Features Recited In Appellants' Claims Which Are Not Made Obvious By The Proposed Combination

As regards claim 17, the prior art does not make obvious the claimed process applied to the specified layer, wherein the aqueous acid suspension of colloidal silica particles impregnated within the rubbing support contains "a surfactant", let alone a non-ionic surfactant as per claim 18 or and an anionic surfactant as per claims 18 and 19.

With respect to claims 26-30, and particularly in relation to Bruxvoort, it is even more clear that Appellants' aqueous acid suspension is a liquid, wherein the surfactant is not immobilized within a solid.

With respect to claims 31-36, no prior art mentions any quantity of surfactant which should be incorporated into any polishing slurry.

#### IV. There IS No Prima Facie Case Of Obviousness

As understood, the Examiners agree that the present invention defines over Jacquinet in the use of a surfactant in the aqueous acid suspension of colloidal silica particles. As further understood, the Examiner relies on Bruxvoort for this purpose.

The next question then is what the prior art in any possible combination teaches those of ordinary skill in the art.

The rejection focuses on the surfactant added to the fixed abrasive pad to modify the surface of the abrasive particles. Appellants submit with respect that such a teaching is irrelevant, and that such addition of a surfactant in the manufacture of the abrasive coated pad is non-analogous to the present invention and teaches the person of ordinary skill in the art nothing with respect to the present invention.

As noted above, Fig. 3 of Bruxvoort discloses the feeding of the liquid medium to the interface between the semi-conductor wafer and the abrasive coated pad. A basket or shotgun disclosure of liquid media which may be used is set forth at column 12, lines 45-56. There follows further basket or shotgun disclosures of additives which may be present including chemical etchants (paragraph spanning columns 12 and 13), oxidizing agents (column 13, line 4), "surfactants, wetting agents, buffers, rust inhibitors, lubricants, soaps, and the like" (column 13, lines 14-15). A long listing of lubricants is given (column 13, lines 24-30), but Appellants find no disclosure of any particular or particular types of surfactants or wetting agents (or the quantities thereof) to be added to the liquid to be fed between the pad and the work piece.

The working examples provide no additional information which would lead the person of ordinary skill in the art to the present invention. In Test Procedure I, noting especially column 53 commencing at line 26, it will be seen that the liquid used was a potassium hydroxide solution in de-ionized water with a pH of about 11.5-12.5. Test Procedures II and III were the same in this regard. Test Procedure IV apparently used tap water (column 54, line 12). Test Procedure V used deionized water and a ceria sol.

Test Procedures VI-XVII reverted to the use of the same or similar potassium hydroxide solutions. Test Procedure XVIII added an abrasive slurry to the potassium hydroxide solution. The remaining test procedures reverted to the potassium hydroxide solution.

Examples 1-25 relate to the manufacture of the abrasive coated pad. Examples 26 and 27 were tested according to Test Procedure I, Example 28 according to Test Procedure III, Examples 29 and 30 according to Test Procedure IV, Examples 31 according to Test Procedure VI, Examples 32 and 33 according to Test Procedure IV, etc. **Not a single one of the 147 examples of Bruxvoort shows the use of a surfactant in the liquid medium fed to the interface between the work piece and the abrasive coated pad.**

One question then is what does Bruxvoort fairly teach the person of ordinary skill in the art, i.e. what is the motivation or incentive it provides. Stated another way, where does the reference lead the person of ordinary skill in the art (*Ex parte Levengood*, 28 USPQ2d 1300; *In re Zurko*, 42 USPQ2d 1476). The examples of Bruxvoort do indeed provide concrete teachings or "leadings", but not toward Appellants' invention. The general basket or shotgun disclosure of Bruxvoort is so immense that it leads the person of ordinary skill in the art in no particular direction, but at best in all possible

directions. In this regard, attention is invited to *Ex parte Garvey*, 41 USPQ 583 (1939) in which the Board stated:

The likelihood of producing a composition such as here claimed from a disclosure such as shown by the Dykstra patent would be about the same as the likelihood of discovering the combination of a safe from a mere inspection of the dials thereof.

\* \* \*

..., as in the Dykstra et al disclosure, the proper one of large number of possible permutations must be chosen to bring the disclosure within the terms of the claims on appeal. Under such circumstances, we do not feel that the patent is a fair reference.

The same idea was expressed in *Laitram Corp. v. Cambridge Wire Cloth*, 226 USPQ 289, 293 (1985) where it was stated:

To illustrate this notion, you cannot claim that the existence of a unicorn should be obvious from taking a trip to the zoo and seeing a horse and a white rhinoceros in adjacent cages. It takes a spark of inventiveness to look at a horse and then look at a white rhinoceros and then conceive the idea of a white horse with a horn.

The point Appellants wish to emphasize in this regard is that the options mentioned in *Bruxvoort* are so numerous as to encompass practically every possibility, except with regard to the abrasive coated pad which concerns the *Bruxvoort* invention. *Bruxvoort* does not really provide any guidance that one should follow any other particular expedient. The only real guidance, other than in the selection of the abrasive coated pad (although even this point is given rather



broadly), is in the examples, and the examples do not lead the skilled artisan toward the case of a surfactant in the liquid medium. To the contrary, the examples given in Bruxvoort are markedly different and lead the person of ordinary skill in the art **away** from Appellants' invention.

Thus, if one of ordinary skill in the art were to look at Jacquinet and Bruxvoort together (and also with Robinson, which Appellants believe is irrelevant), such an artisan of ordinary skill in the art would only be tempted to change the nature of the pad in Jacquinet, and not change the abrasive slurry. If one wanted to change the abrasive slurry, one would gain from Bruxvoort no reason for doing so. Moreover, one would have so many possible ways of changing the slurry from what is stated in Bruxvoort as to not know in which direction the change should be made.

The Examiners have not met their burden.

V. Appellants' Invention Provides Unexpectedly Improved Results

Jacquinet '159 is clearly the closest prior art, as it relates to a process similar to that of the present invention, but wherein the abrasive composition contains no surfactant. **There is no doubt whatsoever that addition of a surfactant according to the present invention produces surprisingly improved results, i.e. non-obvious subject**

**matter.** There is nothing in the subsidiary references which would have led one to reasonably expect that the addition of a surfactant to the liquid composition of Jacquinot '159 would produce improved results.

Thus, in the present invention, the use of a surfactant in the aqueous acid suspension allows the polishing speed of the silicon nitride to be reduced very considerably while preserving a sufficiently great polishing speed of the silicon oxide. In this regard, it is again noted that Appellants' specification states as follows at page 7, lines 7-11:

The surfactant used allows the polishing speed of the silicon nitride to be reduced very considerably whilst preserving the polishing speed of the silicon oxide. A selective polishing of the silicon oxide relative to the silicon nitride is thus obtained. It also allows the polishing speed of polymers with a low dielectric constant to be increased very considerably.

A selective polishing of the silicon oxide related to the silicon nitride is thus obtained; please also see example 1, test 4 (comparative); example 2, test 9 (comparative); example 3, test 11 (comparative); example 4, test 13 (comparative). As stated above, the use of the surfactant further allows the polishing speed of polymers with a low dielectric constant to be increased very considerably (please also note example 5 of the present specification).

Accordingly, it surprisingly turns out that the presence of a surfactant as part of the liquid polishing composition very substantially increases the polishing performance, a result which could not have been reasonably expected from a consideration of the cited prior art, and certainly not a result which could have been predicted or foreseen.<sup>2</sup>

Appellants respectfully submit that even if it were to be considered that Bruxvoort fairly suggests to one skilled in the art that some benefit is to be achieved by adding a surfactant to the liquid composition of Jacquinet, contrary to Appellants' position, this **still** does not teach the present invention, because that does not take into account the unobviously improved results achieved according to the present invention as alleged in Appellants' presumptively accurate disclosure and as shown in the comparative data present in the Examples of Appellants' specification. Appellants respectfully repeat that the prior art provides no reasonable expectation of the improved polishing achieved according to the present invention.

---

<sup>2</sup> In the Reply to the final Action, Appellants asked the Examiner, if the Examiner disagreed "to point out where in the references there is any suggestion, any teachings or even the remotest inference that adding a surfactant to a liquid polishing composition would improve the results as are achieved according to the present invention." The Examiner did not answer.

CONCLUSION

Appellants respectfully submit that the Examiners' combination rejection is unreasonable, that no *prima facie* case of obviousness has been established, and therefore the Examiners have not met their burden.

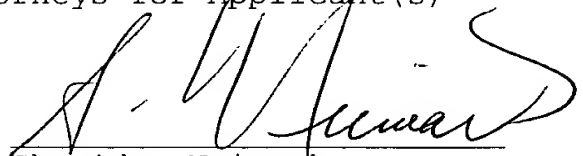
The prior art provides no incentive or motive for adding a surfactant to the composition of Jacquinot. The prior art provides no suggested benefit for doing so. To add another ingredient without any expected benefit would merely add to the cost, clearly an undesirable option. But Appellants have surprisingly found that the use of a surfactant provides unexpected polishing benefits as set forth in Appellants' specification. Certainly this is unobvious.

The rejection should be reversed and such is respectfully prayed.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.  
Attorneys for Applicant(s)

By

  
Sheridan Neimark  
Registration No. 20,520

SN:jaa  
Telephone No.: (202) 628-5197  
Facsimile No.: (202) 737-3528  
F:\,R\INU\jacquinot7\pto\brief.doc

APPENDIX

17. A process for mechanical chemical polishing in the integrated circuits industry, comprising

rubbing a layer with a support impregnated with an abrasive composition, wherein

said layer is (1) a material selected from the group consisting of silicon oxide, silicon nitride, and a polymer having a low dielectric constant, or (2) one layer of silicon oxide and another layer of silicon nitride, and

said abrasive composition comprises an aqueous acid suspension of

(i) individualized colloidal silica particles not linked to each other by siloxane bonds,  
together with (ii) a surfactant.

18. The process of claim 17, wherein said surfactant is an anionic or non-ionic surfactant.

19. The process of claim 18, wherein said surfactant is anionic.

20. The process of claim 19, wherein said rubbing is carried out with said composition at pH between 1 and 5,  
and

said individualized colloidal silica particles have diameters between 12 nm and 100 nm.

21. The process of claim 18, wherein said rubbing is carried out with said composition at pH between 1 and 5, and

said individualized colloidal silica particles have diameters between 12 nm and 100 nm.

22. The process of claim 17, wherein said rubbing is carried out with said composition at pH between 1 and 5, and

said individualized colloidal silica particles have diameters between 12 nm and 100 nm.

23. The process of claim 22, wherein said pH is between 2 and 3, and

said particle size is between 35 and 50 nm.

24. The process of claim 21, wherein said pH is between 2 and 3, and

said particle size is between 35 and 50 nm.

25. The process of claim 20, wherein said pH is between 2 and 3, and

said particle size is between 35 and 50 nm.

26. The process of claim 25, wherein the concentration by weight of said individualized colloidal

silica particles is between 25 and 35 % in said aqueous acid suspension.

27. The process of claim 24, wherein the concentration by weight of said individualized colloidal silica particles is between 25 and 35 % in said aqueous acid suspension.

28. The process of claim 23, wherein the concentration by weight of said individualized colloidal silica particles is between 25 and 35 % in said aqueous acid suspension.

29. The process of claim 22, wherein the concentration by weight of said individualized colloidal silica particles is between 25 and 35 % in said aqueous acid suspension.

30. The process of claim 21, wherein the concentration by weight of said individualized colloidal silica particles is between 25 and 35 % in said aqueous acid suspension.

31. The process of claim 18 wherein the volumetric concentration of said surfactant is between 0.001% and 5%.

32. The process of claim 20 wherein the volumetric concentration of said surfactant is between 0.001% and 5%.

33. The process of claim 25 wherein the volumetric concentration of said surfactant is between 0.001% and 5%.

34. The process of claim 18, wherein the volumetric concentration of said surfactant is between 0.01% and 1%.

35. The process of claim 22, wherein the volumetric concentration of said surfactant is between 0.01% and 1%.

36. The process of claim 26, wherein the volumetric concentration of said surfactant is between 0.01% and 1%.